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EXAMINER

BELLO, AGUSTIN

ART UNIT PAPER NUMBER

2633

DATE MAILED: 03/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/083,491

Applicant(s)

NIKIFOROV ET AL.

Examiner

Agustin Bello

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 4/23/03.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 16-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. Claims 16-17 recite the limitation "said transceivers" and "second optical transmitter."

There is insufficient antecedent basis for these limitations in the claim.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-5 and 12-13 are rejected under 35 U.S.C. 102(b) as being anticipated by Johnson (U.S. Patent No. 5,606,444).

Regarding claim 1, Johnson teaches an apparatus for wireless duplex communication, comprising, a first optical transceiver (reference numeral 36, 38 in Figure 3) having a first optical transmitter (reference numeral 36 in Figure 3) and a first optical receiver (reference numeral 38 in Figure 3), a second optical transceiver (left side reference numeral 36, 38 in Figure 3) having a first optical transmitter (reference numeral 36 in Figure 3) and a first optical receiver (reference numeral 38 in Figure 3), the first and second optical transceivers being located at the

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opposite end of an optical communication line formed thereby (as seen in Figure 3), wherein the output of each of the optical transmitters is a diverging beam of incoherent electromagnetic radiation arranged to have a cross sectional diameter which is larger than the cross sectional diameter of the respective optical receiver at that point on the communication line at which the respective optical receiver is situated (as seen in Figure 4).

Regarding claim 2, Johnson teaches that the optical transmitter emits electromagnetic radiation having a range of wavelengths (e.g. light output from LED 42 in Figure 4).

Regarding claim 3, Johnson teaches that the optical transmitter emits radiation in the range 800 to 900 nanometers (e.g. "infrared" throughout).

Regarding claim 4, Johnson teaches that the optical transmitter comprises a light emitting diode (reference numeral 42 in Figure 4) which provides the diverging beam of incoherent electromagnetic radiation.

Regarding claim 5, Johnson teaches that optical transmitter comprises the LED (reference numeral 42 in Figure 4) and further comprises at least one optical condenser lens (column 5 lines 16-21), the input to the optical condenser lens being provided by the LED and the output of the optical transmitter being provided by the optical condenser.

Regarding claims 12 and 13, Johnson teaches that the input of the optical transmitter (reference numeral 42 in Figure 4) of the first transceiver is connected to an output of a converter through a modulator (reference numeral 43 in Figure 4), and an output of the optical receiver of the first transceiver (reference numeral 66 in Figure 4) is connected to an input of a demodulator (reference numeral 70 in Figure 4), the output thereof being connected to an input of a converter (column 6 lines 53-58).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 6-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson in view of Ruziak (U.S. Patent No. 6,256,296).

Regarding claim 6, Johnson teaches that the optical receiver consists of an optical condenser lens (column 5 lines 66 – column 6 line 5) and photodiode (reference numeral 66 in Figure 4). Johnson differs from the claimed invention in that Johnson fails to specifically teach a diaphragm wherein the diaphragm is installed in the focal plane of the optical condenser lens. However, Ruziak, in the same field of free-space communication, teaches that installing a diaphragm in the focal plane of the optical condenser lens is well known in the art (reference numeral 84 in Figure 6). One skilled in the art would have been motivated to employ a diaphragm in the focal plane of the optical condenser lens in order to provide good index matching between the concentrator and the photodiode (column 8 lines 1-4). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to employ a diaphragm in the focal plane of the optical condenser lens as taught by Ruziak in the device of Johnson.

Regarding claim 7, the combination of Johnson and Ruziak teaches that the distance A between the photodiode and the diaphragm situated in the focal plane of the optical condenser

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lens is defined by the formula $\Delta = b F / D_c$. Clearly, one skilled in the art can define the distance in these terms.

Regarding claim 8, the combination of Johnson and Ruziak teaches that the input of the optical condenser is the input of the optical receiver, and the output of the photodiode is the output of the first optical receiver (as seen in Figure 4 of Johnson and Figure 6 of Ruziak).

Regarding claim 9, the combination of Johnson and Ruziak teaches that the beam angle θ characterizing of the first optical transmitter and the first optical receiver of each of the said transceivers is defined from the following condition: $\tan 2 \theta = a/F$. Clearly, one skilled in the art can define the beam angle θ in these terms.

Regarding claim 10, one skilled in the art would clearly have recognized the ability to concentrate the beam angle to a divergence between 30 and 60 angular minutes by selection of the proper dimensions of horn concentrator (reference numeral 44 in Figure 4) of Johnson. One skilled in the art would have been motivated to do so in order to distribute equal light intensity over the entire target area (column 5 lines 6-15). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to concentrate the beam angle to a divergence between 30 and 60 angular minutes.

Regarding claim 11, one skilled in the art would clearly have recognized the ability to design the system of Johnson so that the distance between the transmitter and receiver of the transceiver is greater than or equal to 15cm. This would have been a matter of design choice for one skilled in the art.

8. Claims 14-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson.

Regarding claim 14, Johnson differs from the claimed invention in that Johnson fails to specifically teach that the converter is made in the form of a transformer, which transforms the signals of the input discrete information into a coded signal using the Manchester code during transmission, and which is capable of a reverse transformation of signals coming from the outputs of the respective demodulators during reception. However, Official Notice is taken that such converters are well known in the art and readily available. One skilled in the art would have been motivated to employ a converter of this type in order to transmit data in a robust and efficient manner, as provided by the Manchester code. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to employ a converter that is made in the form of a transformer, which transforms the signals of the input discrete information into a coded signal using the Manchester code during transmission, and which is capable of a reverse transformation of signals coming from the outputs of the respective demodulators during reception.

Regarding claim 15, Johnson differs from the claimed invention in that Johnson fails to specifically teach that the optical transceiver comprises a second optical transmitter and a second optical receiver. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to include additional transmitters and receivers in the design of Johnson, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Combination of. v. Bemis Co.*, 193 USPQ 8.

Regarding claim 16, Johnson differs from the claimed invention in that Johnson fails to specifically teach that the transceivers are connected to the input of the respective demodulators

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through a summator. However, the use of summators in receiving circuits for optical communication systems are very well known in the art, and Official Notice is taken for such. One skilled in the art would have been motivated to include a summator connected the respective demodulators in order to provide heterodyne detection of the received signals. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to employ a summator in the device of Johnson.

Regarding claim 17, Johnson teaches that the input of the optical transmitter (reference numeral 42 in Figure 4) of the first transceiver is connected to an output of a converter through a modulator (reference numeral 43 in Figure 4), and an output of the optical receiver of the first transceiver (reference numeral 66 in Figure 4) is connected to an input of a demodulator (reference numeral 70 in Figure 4), the output thereof being connected to an input of a converter (column 6 lines 53-58). Johnson fails to specifically teach that the optical receiver is connected through a summator. However, as stated above, the use of summators in receiving circuits for optical communication systems are very well known in the art, and Official Notice is taken for such. One skilled in the art would have been motivated to include a summator connected the respective demodulators in order to provide heterodyne detection of the received signals. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to employ a summator in the device of Johnson.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Agustin Bello whose telephone number is (571) 272-3026. The examiner can normally be reached on M-F 8:30-6:00.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571)272-3022. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AB



AGUSTIN BELLO
PATENT EXAMINER

2/27/05